173156

DIRECT TESTIMONY OF

Dwight M. Hollifield, ASLA

ON BEHALF OF

SOUTH CAROLINA ELECTRIC & GAS COMPANY

DOCKET NO. 2005-58-E

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Dwight M. Hollifield. My business address is 400 South Tryon Street, Charlotte, NC 28285.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am employed by Framatome ANP as General Manager of the Facilities Planning and Siting department.

Q. PLEASE BRIEFLY DESCRIBE YOUR EDUCATIONAL BACKGROUND, PROFESSIONAL ASSOCIATIONS, AND BUSINESS EXPERIENCE.

A. I received an AS degree in horticulture form Catawba Valley College in 1967. I have been a registered landscape architect in South Carolina since 1976 and am a member of the American Society of Landscape Architects. I am also a Certified Professional in Erosion and Sediment Control. I was employed by Duke Power Company and Duke Engineering & Services from July 1967 until May 2002 when Framatome ANP purchased Duke Engineering and Services. During my career with Duke, I was directly involved in transmission system planning as it related to siting and site development planning for transmission lines and substations. My responsibilities included assessing the environmental, cultural resource, land use, and aesthetic effects of transmission line and substation

projects and supervising the development of site preparation plans to fulfill permit conditions. At Framatome ANP, my staff and I are still engaged in these activities under contract to a number of electric utility clients, including South Carolina Electric & Gas Company ("SCE&G").

Since 1987, I have managed the successful siting and permitting of more than 140 transmission lines and electrical substations.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to discuss the transmission line siting issues that SCE&G, in collaboration with Framatome ANP, considered when choosing the route for the Hopkins 230kV Fold-In Line ("230kV Fold-In" or "Fold-In"). I provided information regarding the environmental, land use, cultural resource, and visual effects of the proposed 230kV Fold-In and the proposed Hopkins 230-115kV Transmission Substation ("Hopkins Transmission Substation").

Q. DO YOU HAVE ANY DOCUMENTS THAT SUPPORT OR ILLUSTRATE YOUR TESTIMONY?

A. Yes. As SCE&G's siting and project permitting consultant, I am the author of the *Environmental Assessment Report for the Proposed Hopkins 230kV Fold-In Line and Hopkins 230-115kV Transmission Substation* ("Environmental Assessment Report"), which was attached as Exhibit A to SCE&G's application in this docket. Additionally, I am the sponsor of the *Biological Survey Report for the Proposed Hopkins 230kV Fold-In Line and Hopkins 230-115kV Transmission Substation* ("Biological Report") and the *Archaeological Survey of the Hopkins*

Transmission Line Corridor and Substation Tract, Richland County, SC ("Cultural Resources Report"). These reports detail the research and studies conducted regarding the environmental, land use, cultural resource, and visual effects of the future 230kV Fold-In and Hopkins Transmission Substation. The Biological Report and Cultural Resources Report are included as Appendix B and C, respectively, to the Environmental Assessment Report.

Q. PLEASE DESCRIBE THE PROPOSED LINE'S ROUTE AND ANY ALTERNATE ROUTES THAT MAY HAVE BEEN CONSIDERED IN ADDITION TO IT.

A. The proposed Fold-In will be approximately 1.32-miles long. The line connects to SCE&G's existing Wateree-Columbia Energy 230kV Line approximately 0.92-miles south-southwest of Westinghouse Electric Company's facility in Richland County, South Carolina. The Fold-In parallels SCE&G's existing Westinghouse 115kV line for approximately 0.64-miles and then veers away from the 115kV line and runs approximately 0.68-miles to the future Hopkins Transmission Substation. The line will be constructed on a new 100'-wide right-of-way that will be acquired from three property owners, including Westinghouse Electric Company, LLC, from whom SCE&G purchased the 6.89-acre Hopkins Transmission Substation site. Each of the three property owners was notified of the proposed route for the 230kV Fold-In. No objections to its location over their respective properties have been received.

SCE&G conducted a comprehensive line siting study to determine the route for the 230kV Fold-In. A siting project area was delineated that included

the entire geographic area through which any practical route connecting the Wateree-Columbia Energy 230kV Line and the site purchased for the Hopkins Transmission Substation would pass. Data was collected to characterize the project area and to identify any environmental, land use, or cultural resource factors that should be taken into consideration during the Fold-In siting study. After mapping an array of data, SCE&G determined that routing the proposed 230kV Fold-In parallel to its existing Westinghouse 115kV Line for approximately one-half of its total length would be superior to any alternate route. The following reasons support this selection:

1. Following the existing line right-of-way for approximately one-half of the proposed line's total length minimizes its overall length and allows use of existing roads to access the new right-of-way.
2. The proposed route optimizes crossing locations over forested wetlands with no structures located in a wetland.
3. The proposed route minimizes effects to existing and future land uses by expanding the existing right-of-way and not introducing a totally new transmission corridor.
4. The proposed route does not affect rare, threatened, or endangered species or cultural resources.

Based on my experience with conducting comparative evaluations of alternate transmission line routes through the application of quantified and qualitative environmental, land use, cultural resource, and visual resource factors, the chosen proposed route is measurably superior to any alternative route.

Q. PLEASE DESCRIBE THE ENVIRONMENTAL IMPACTS OF THE PROPOSED TRANSMISSION LINES AND ASSOCIATED FACILITIES.

A. The construction and operation of the 230 kV Fold-In and associated Hopkins Transmission Substation will not have any significant short- or long-term impacts on the environment. Wetlands crossed by the 230kV Fold-In Line will be spanned, and no wetlands will be affected by the substation. No rare, threatened, or endangered species will be adversely impacted by the project.

Q. WHAT WAS THE CONCLUSION OF THE ENVIRONMENTAL AND BIOLOGICAL STUDIES THAT WERE CONDUCTED FOR THIS PROJECT?

A. The proposed 230kV Fold-In Line and associated Hopkins Transmission Substation will have no significant short- or long-term effects on the environment.

Q. WHAT WAS THE CONCLUSION OF THE CULTURAL RESOURCE INVESTIGATION THAT WAS CONDUCTED ALONG THE ROUTE OF THE PROPOSED LINE?

A. The 230kV Fold-In Line and associated Hopkins Transmission Substation will have no adverse effect on historic sites or historic districts.

Q. WHAT WILL BE THE VISUAL EFFECTS OF THE PROPOSED 230KV LINE AND TRANSMISSION SUBSTATION?

A. The proposed 230 kV Fold-In and associated Hopkins Transmission Substation will be located in a remote area on private property. Neither will be visible from public roads, commercial facilities, public facilities, or private residences.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

173156

DIRECT TESTIMONY OF

HUBERT C. YOUNG, III

ON BEHALF OF

SOUTH CAROLINA ELECTRIC & GAS

DOCKET NO. 2005-58E

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Hubert C. Young, III. My business address is 1426 Main Street, Columbia, South Carolina.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am employed by South Carolina Electric and Gas Company (SCE&G or the Company) where I am the Manager of Transmission Planning.

Q. PLEASE BRIEFLY DESCRIBE YOUR EDUCATIONAL BACKGROUND AND BUSINESS EXPERIENCE.

A. I am a graduate of Clemson University with a Bachelor of Science degree in Electrical and Computer Engineering. I am a registered Professional Engineer in the State of South Carolina.

I began working for South Carolina Electric & Gas Company in 1975 and during my career with SCE&G I've held positions in the Engineering Computer Support Department and Transmission Planning.

Q. ARE YOU A MEMBER OF ANY INDUSTRY COMMITTEES FOR SYSTEM RELIABILITY ASSESSMENT OR PLANNING?

A. I am currently a member of the North American Electric Reliability Council (NERC) Reliability Assessment Subcommittee (RAS), NERC Standards Authorization Request (SAR) Ballot Body, Southeastern Electric Reliability Council (SERC) Engineering Committee, SERC Engineering Committee Executive Committee, SERC Reliability Review Subcommittee, SERC Planning Standards Working Group, SERC Compliance Audit Team, and the VACAR (Virginia/Carolinas – includes SCE&G, Duke Power, Progress Energy Carolina, Virginia Power, Santee Cooper, SEPA, NCEMC, and Fayetteville, NC) Planning Task Force.

All of these committees are directly involved with setting reliability standards for the electric power industry or assessing the current and future capabilities of the integrated transmission grid in North America, the southeast, and the Virginia/Carolinas.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to discuss the need and necessity for the construction of new 230 kV transmission lines in the southeastern area of Columbia and an associated 230/115 kV substation to be located near Hopkins, South Carolina. See Exhibit No. __ (HCY-1).

This project includes the construction of new 230 kV transmission lines as a fold-in and out of the existing Wateree-Columbia Energy 230 kV transmission line into the new Hopkins substation. This fold-in and out is approximately 1.32 miles one way. These lines will be built on a new right-of-way originating at the existing Wateree-Columbia Energy 230 kV line and connecting to the new Hopkins substation. Right-of-way acquisition and permitting is underway. Only three property owners are affected by the construction of the 230 kV line. One of these property owners is Westinghouse, from whom the Hopkins Substation site was acquired. A typical cross-section of the new transmission line construction is shown in Exhibit No. __ (HCY-2).

The associated substation will be called the Hopkins 230/115 kV substation and will be located on the Westinghouse Electric Company property off Bluff Road. See Exhibit No. __ (HCY-3).

The associated substation will include a 230/115 kV - 336 MVA transformer, two 230 kV transmission line terminals, three 115 kV transmission line terminals, and one 115 kV bus-tie breaker. See Exhibit No. __ (HCY-4).

Q. WHAT CRITERIA DOES SCE&G USE TO DETERMINE WHEN NEW TRANSMISSION FACILITIES ARE NEEDED?

A. Our Company subscribes to the Planning Standards and Guides established by the North American Electric Reliability Council

(NERC) (see Exhibit No. __ (HCY-5)) and SCE&G's Long Term Planning Criteria (see Exhibit No. __ (HCY-6)). In accordance with these criteria the SCE&G Transmission System is designed such that during any of the following contingencies, only short-time overloads, low voltages, and local loss of load will occur. After appropriate switching and re-dispatching, all non-radial loads can again be served with reasonable voltages, and all facilities can again operate within acceptable limits. A *sample* of contingencies considered includes:

1. Loss of any generator;
2. Loss of any transmission circuit operating at a voltage level of 115kV or above;
3. Loss of any transmission transformer;
4. Loss of any electrical bus and associated facilities operating at a voltage level of 115kV or above;
5. Loss of entire generating capacity in any one plant;
6. Loss of all circuits on a common structure;
7. Loss of any generating unit simultaneously with the loss of a single transmission line;
8. Loss of all components associated with a breaker failure; and
9. Loss of any generator, transmission circuit, or transmission transformer, followed by manual system adjustments, followed by the loss of another generator, transmission circuit, or transmission transformer.

Q. WHY ARE THE TRANSMISSION LINES AND THE ASSOCIATED HOPKINS SUBSTATION NEEDED?

A. The transmission lines and associated Hopkins substation are needed to serve system reliability. The addition of these facilities will improve the reliability of electric service to customers in the southeastern Richland County area by providing backup service for power in the event that the sole existing transmission substation in the area should fail for any reason.

The Columbia Southeastern and Lower Richland area (bounded by the Congaree River, Fort Jackson, and the edge of the SCE&G service territory near Eastover, South Carolina) has a total customer load of approximately 220 megawatts (MW). This customer load is currently served through five 115 kV distribution substations and four single customer substations. See Exhibit No. __ (HCY-7). All of these substations and therefore the total 220 MW of customer load are served from the existing Columbia Industrial Park (CIP) 230/115 kV substation located on Bluff Road.

In the past, following any event in the CIP Substation that caused the substation to fail or become unavailable, customer load in this area would be served by two 115 kV transmission lines extending into the area – one from the West Columbia area and one from the Saluda Hydro/McMeekin generating complex located at Lake Murray. See Exhibit No. __ (HCY-8). The power flowing on these two 115 kV

transmission lines during a CIP outage has now reached the capacity of the lines and these lines can no longer provide backup service for the entire 220 MW of customer load on the Columbia Southeastern and Lower Richland area. An improved backup service for the customers in this area is needed. The 230 kV transmission lines and the associated Hopkins substation provide this improved backup service.

Q. DO THE PROPOSED FACILITIES ALSO SERVE SYSTEM ECONOMY?

A. Yes, the proposed facilities serve system economy in two ways. First, this proposal is the least expensive and best long-term solution to increase reliability for the customers in the Columbia Southeastern and Lower Richland area. Second, the proposed facilities also serve system economy by increasing the efficiency of SCE&G's physical plant operations.

Q. WITH REGARD TO THE FIRST POINT, EXPLAIN WHY THIS PROPOSAL IS THE BEST ALTERNATIVE.

A. SCE&G Transmission Planning considered several alternatives to provide the needed improvement.

One alternative considered was to increase the capability of the two overloaded 115 kV transmission lines to carry more customer load. The results of this study indicated that this alternative is much more expensive and this would be only a short-term solution. Even

with the line improvements, studies indicate that as customer load continues to grow in the area service voltages will decline to unacceptable levels.

A second alternative considered was to install a second 230/115 kV transformer in the existing CIP Substation. The results of this study indicated that this alternative was also more expensive and this also would be only a short-term solution. Installing a second transformer in the existing CIP Substation creates a very heavy dependency on the CIP Substation. If an event occurs that results in the loss of the CIP Substation then there is no other adequate source to serve customer load in the area.

Because both of these alternatives are short-term solutions, additional transmission improvements and costs would be required in the near future.

Q. WITH REGARD TO YOUR SECOND POINT, EXPLAIN HOW THIS PROPOSAL IMPROVES SYSTEM EFFICIENCY.

A. This project serves system economy in terms of the physical plant efficiency in that the construction of the transmission lines and associated substation permits SCE&G to split the load on its facilities, which is more efficient. Splitting the load between the existing and proposed transmission lines and substations ensures that the equipment is not overloaded and provides for less energy loss over the lines.

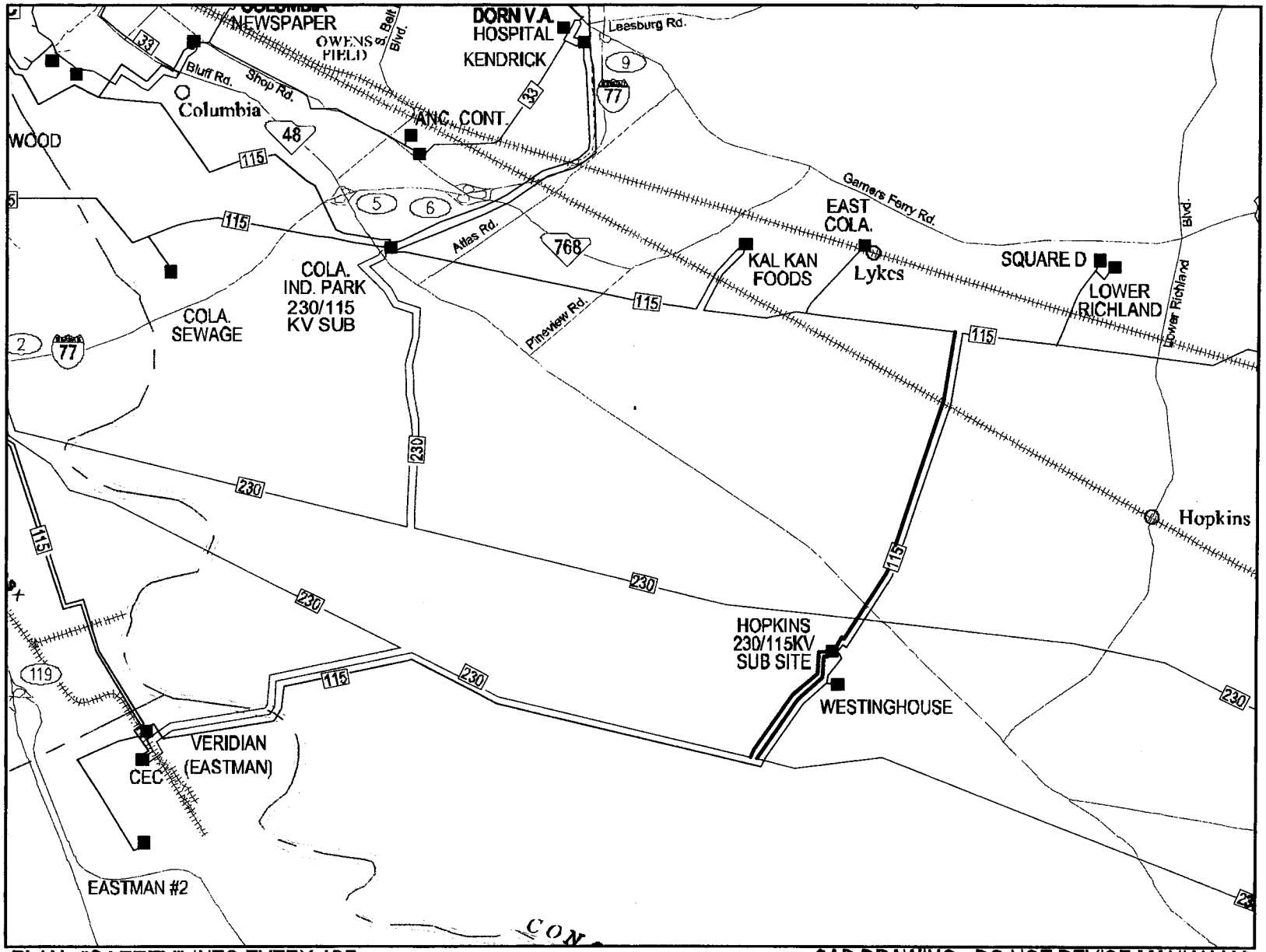
Q. WHAT IS THE ESTIMATED COST AND IN-SERVICE DATE OF THE PROPOSED TRANSMISSION LINES AND THE ASSOCIATED HOPKINS SUBSTATION?

A. The total cost of construction for the 230 kV lines and the associated substation is $4,830,000. The lines and substation are scheduled to be in service in June 2006.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

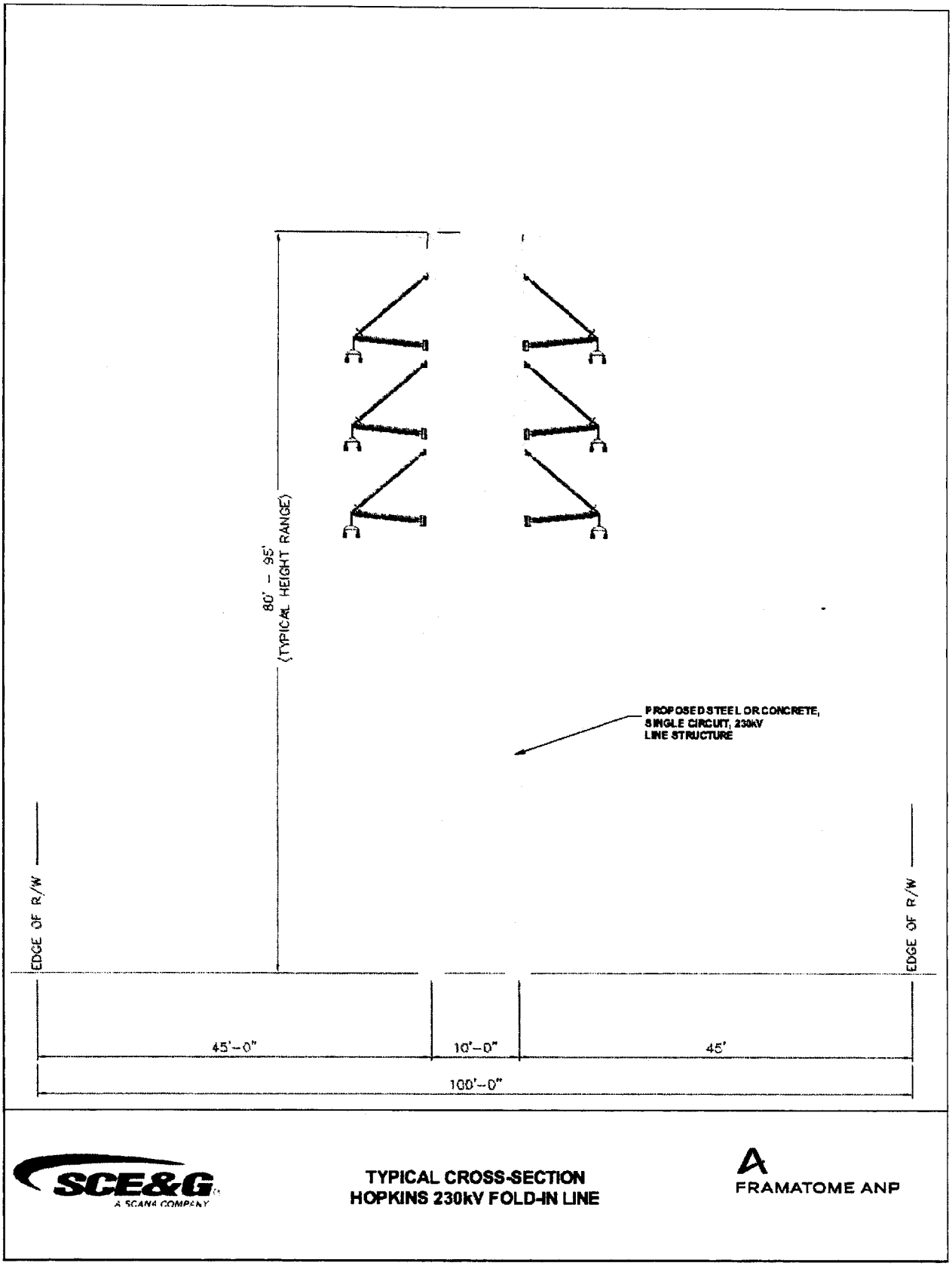
Exhibit No. __ HCY-1



PLAN "SAFETY" INTO EVERY JOB

CAD DRAWING - DO NOT REVISE MANUALLY

Exhibit No. __ HCY-2

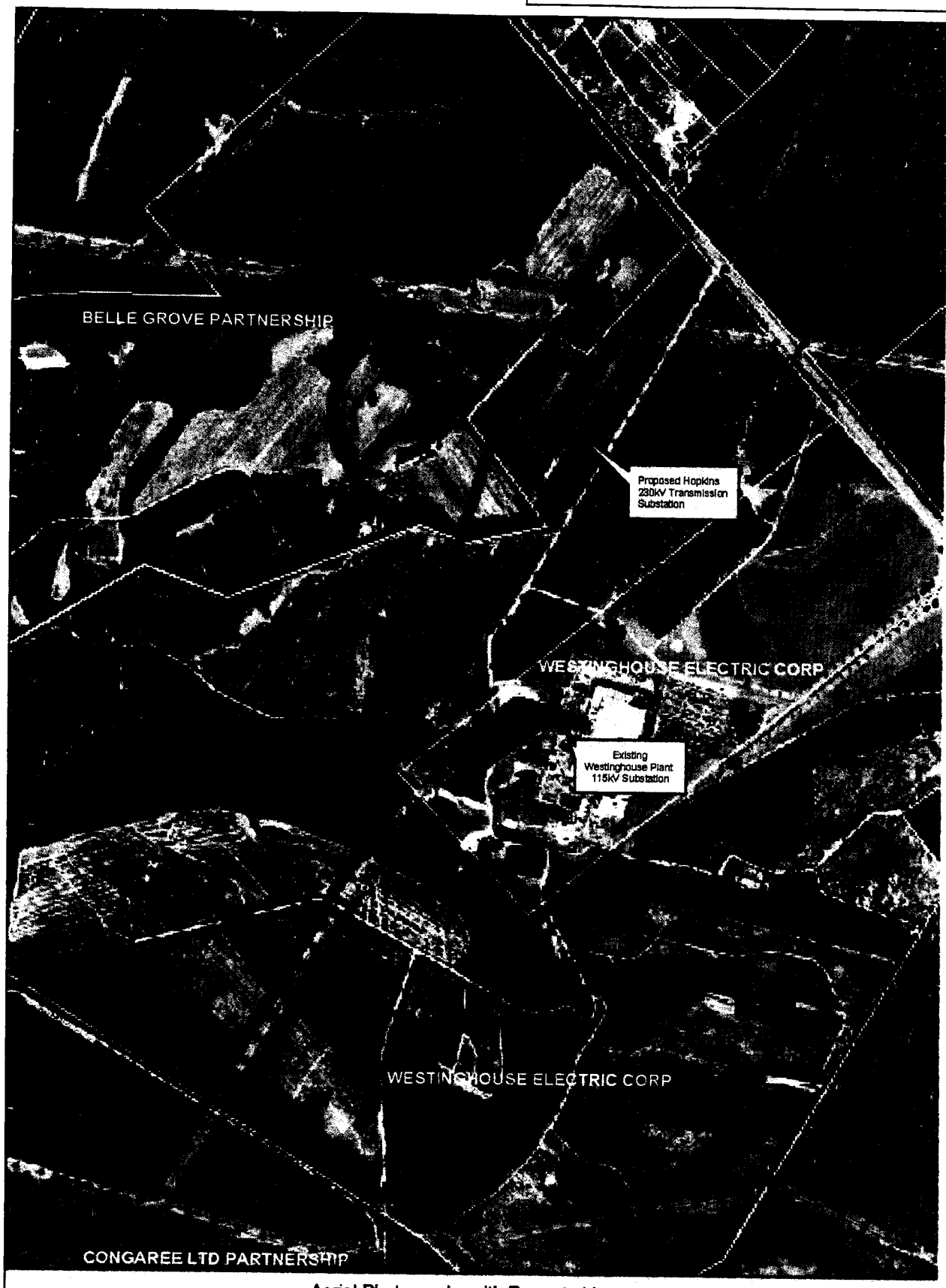


SCE&G
A SCANA COMPANY

TYPICAL CROSS-SECTION
HOPKINS 230kV FOLD-IN LINE

FRAMATOME ANP

Exhibit No. __ HCY-3



Legend

- SCE&G 230kV
- Santee Cooper Electric
- SCE&G 230kV Line
- SCE&G 115kV Line
- Property Lines
- Cemetery
- Subsurface Contamination Area

Aerial Photography with Property Lines

Hopkins 230kV Fold-In
and
Hopkins 230-115kV Transmission Substation
Richland County, South Carolina

0 400 800 1,600 Feet

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SCE&G
A SCANA COMPANY

Exhibit No. __ HCY-4

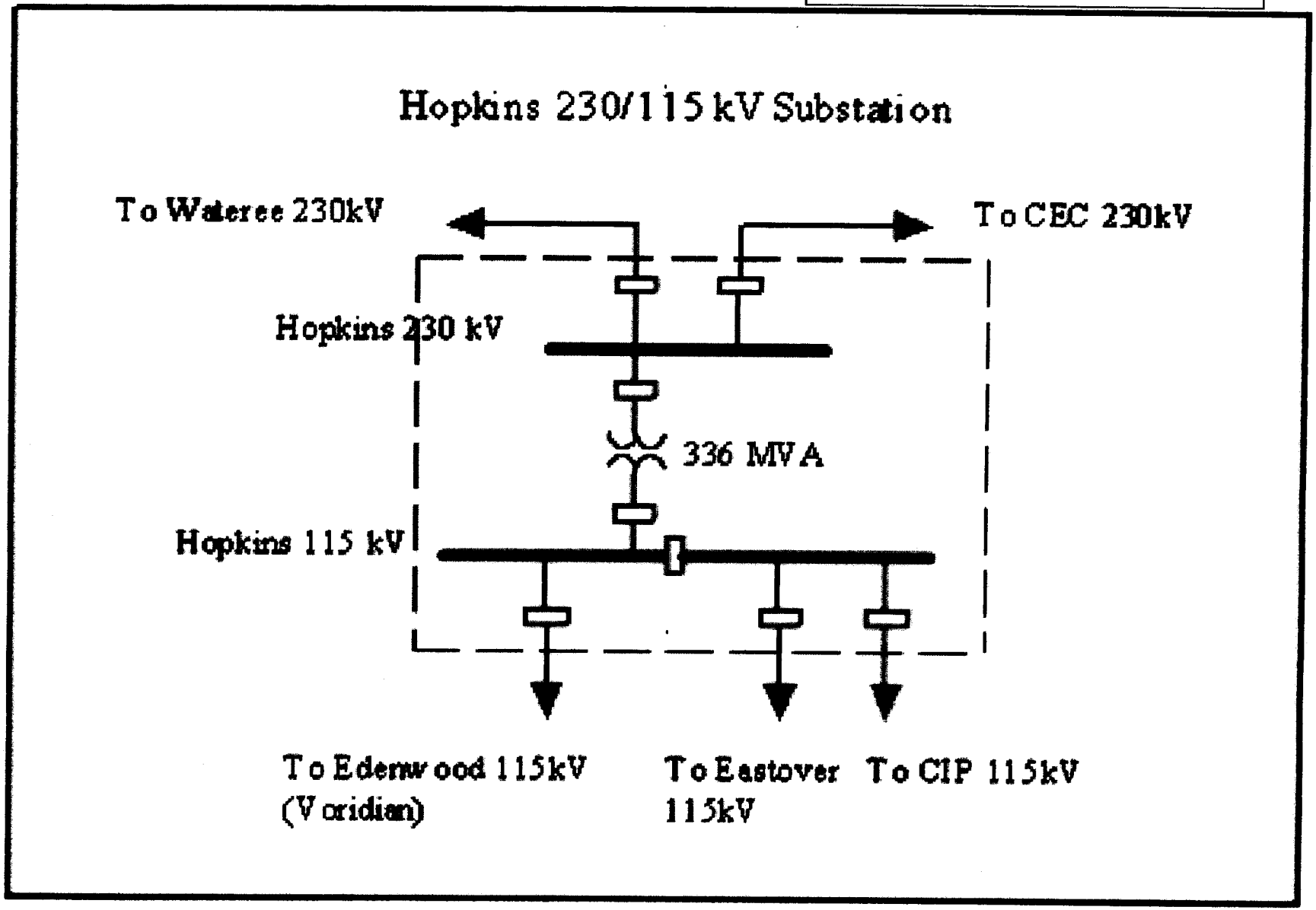

Table I. Transmission Systems Standards – Normal and Contingency Conditions

Category	Contingencies		System Limits or Impacts				
	Initiating Event(s) and Contingency Component(s)	Components Out of Service	Thermal Limits	Voltage Limits	System Stable	Loss of Demand or Curtailed Firm Transfers	Cascading [c] Outages
A – No Contingencies	All Facilities in Service	None	Normal	Normal	Yes	No	No
B – Event resulting in the loss of a single component.	Single Line Ground (SLG) or 3-Phase (3Ø) Fault, with Normal Clearing: 1. Generator 2. Transmission Circuit 3. Transformer Loss of a Component without a Fault.	Single Single Single Single	Applicable Rating [a] (A/R) A/R A/R A/R	Applicable Rating [a] (A/R) A/R A/R A/R	Yes Yes Yes Yes	No [b] No [b] No [b] No [b]	No No No No
	Single Pole Block, Normal Clearing: 4. Single Pole (dc) Line	Single	A/R	A/R	Yes	No [b]	No
C – Event(s) resulting in the loss of two or more (multiple) components.	SLG Fault, with Normal Clearing: 1. Bus Section 2. Breaker (failure or internal fault)	Multiple Multiple	A/R A/R	A/R A/R	Yes Yes	Planned [d] Planned [d]	No No
	SLG or 3Ø Fault, with Normal Clearing, Manual System Adjustments, followed by another SLG or 3Ø Fault, with Normal Clearing: 3. Category B (B1, B2, B3, or B4) contingency, manual system adjustments, followed by another Category B (B1, B2, B3, or B4) contingency	Multiple	A/R	A/R	Yes	Planned [d]	No
	Bipolar Block, with Normal Clearing: 4. Bipolar (dc) Line Fault (non 3Ø), with Normal Clearing: 5. Double Circuit Towerline	Multiple Multiple	A/R A/R	A/R A/R	Yes Yes	Planned [d] Planned [d]	No No
	SLG Fault, with Delayed Clearing: 6. Generator 8. Transformer 7. Transmission Circuit 9. Bus Section	Multiple Multiple	A/R A/R	A/R A/R	Yes Yes	Planned [d] Planned [d]	No No

D [e] Extreme event resulting in two or more (multiple) components removed or cascading out of service	3Ø Fault, with Delayed Clearing (stuck breaker or protection system failure): 1. Generator 2. Transmission Circuit 3. Transformer 4. Bus Section 3Ø Fault, with Normal Clearing: 5. Breaker (failure or internal fault) Other: 6. Loss of towerline with three or more circuits 7. All transmission lines on a common right-of way 8. Loss of a substation (one voltage level plus transformers) 9. Loss of a switching station (one voltage level plus transformers) 10. Loss of a all generating units at a station 11. Loss of a large load or major load center 12. Failure of a fully redundant special protection system (or remedial action scheme) to operate when required 13. Operation, partial operation, or misoperation of a fully redundant special protection system (or remedial action scheme) for an event or condition for which it was not intended to operate 14. Impact of severe power swings or oscillations from disturbances in another Regional Council.	Evaluate for risks and consequences. • May involve substantial loss of customer demand and generation in a widespread area or areas. • Portions or all of the interconnected systems may or may not achieve a new, stable operating point. • Evaluation of these events may require joint studies with neighboring systems. • Document measures or procedures to mitigate the extent and effects of such events. • Mitigation or elimination of the risks and consequences of these events shall be at the discretion of the entities responsible for the reliability of the interconnected transmission systems.

Footnotes to Table I.

a) Applicable rating (A/R) refers to the applicable normal and emergency facility thermal rating or system voltage limit as determined and consistently applied by the system or facility owner.

b) Planned or controlled interruption of generators or electric supply to radial customers or some local network customers, connected to or supplied by the faulted component or by the affected area, may occur in certain areas without impacting the overall security of the interconnected transmission systems. To prepare for the next contingency, system adjustments are permitted, including curtailments of contracted firm (non-recallable reserved) electric power transfers.

c) Cascading is the uncontrolled successive loss of system elements triggered by an incident at any location. Cascading results in widespread service interruption which cannot be restrained from sequentially spreading beyond an area predetermined by appropriate studies.

d) Depending on system design and expected system impacts, the controlled interruption of electric supply to customers (load shedding), the planned removal from service of certain generators, or the curtailment of contracted firm (non-recallable reserved) electric power transfers may be necessary to maintain the overall security of the interconnected transmission systems.

e) A number of extreme contingencies that are listed under Category D and judged to be critical by the transmission planning entity(ies) will be selected for evaluation. It is not expected that all possible facility outages under each listed contingency of Category D will be evaluated.

Exhibit No. __ HCY-6

SOUTH CAROLINA ELECTRIC & GAS COMPANY

LONG RANGE PLANNING CRITERIA

It is recognized that the reliability of power supply in local areas is the responsibility of the individual systems and that each system has internal criteria relating to the more common contingencies. It is further recognized that there are severe contingencies, which are credible, but of a low probability of occurrence, which may result in conditions such as islanding and/or loss of load. Such conditions are considered acceptable as long as they are controlled so as to limit the adverse impact of the disturbance and so as to leave the system or systems in such condition as to permit rapid load restoration and/or reconnection.

The requirements of the SCE&G "LONG RANGE PLANNING CRITERIA" will be satisfied if the system is designed so that during any of the following contingencies, only short-time overloads, low voltages and local loss of load will occur and that after appropriate switching and re-dispatching, all non-radial load can be served with reasonable voltages and that lines and transformers are operating within acceptable limits.

a. Loss of any bus and associated facilities operating at a voltage level of 115kV or above.

b. Loss of any line operating at a voltage level of 115kV or above.

c. Loss of entire generating capability in any one plant.

d. Loss of all circuits on a common structure.

e. Loss of any transmission transformer.

f. Loss of any generating unit simultaneous with the loss of a single transmission line.

Outages more severe are considered acceptable if they will not cause equipment damage or result in uncontrolled cascading outside the local area.

Exhibit No. __ HCY-7

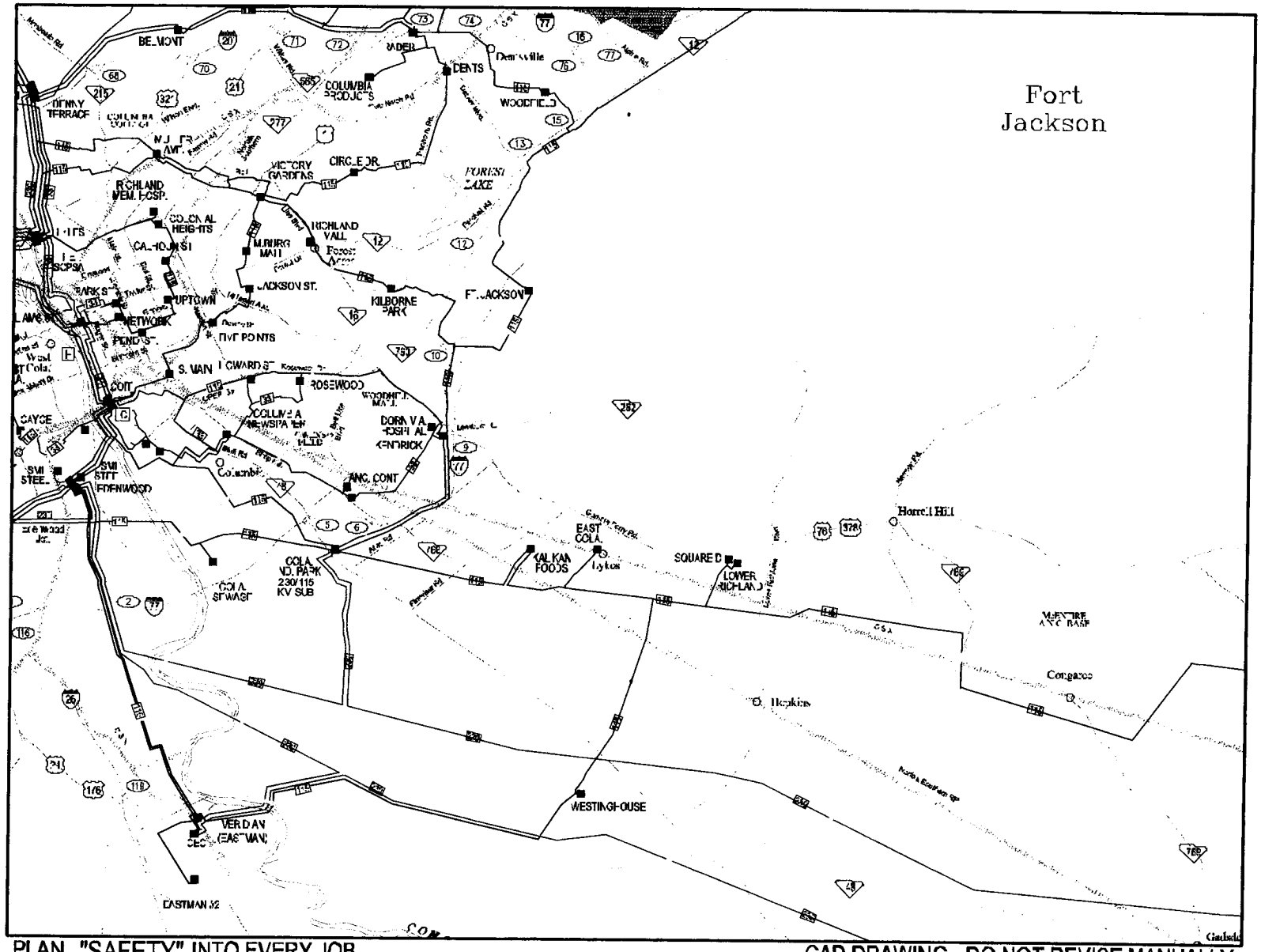

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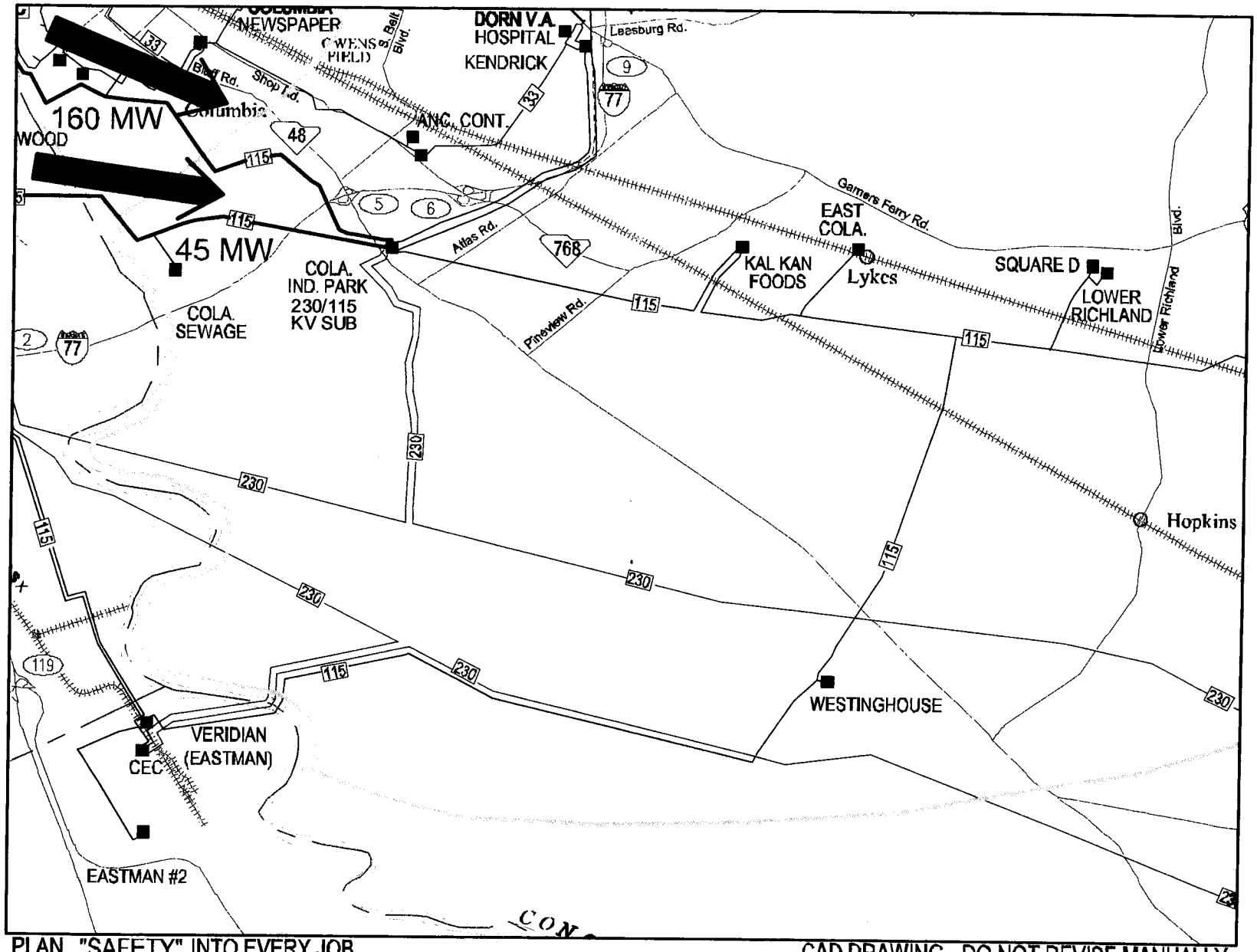
Exhibit No. __ HCY-8



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